REMARKS

In the Office Action mailed June 19, 2006, claims 1-22 were rejected under 35 U.S.C. 103(a) over Dufor (US patent 4933541) in view of Iizuka (US patent 6469831).

The Examiner is thanked for a telephone interview on September 12, 2006 in which the differences between Dufor and the current claims were discussed. The Examiner suggested amending the claims to include additional detail regarding the invention.

Amendments

For clarity, claim 14 has been amended to remove the word "optional" as it refers to compensating optic. This amendment to claim 14 is supported by the figures of the specification as filed. Claim 1 has been amended to clarify there are two signals provided. This amendment to claim 1 is supported by the figures of the specification as filed.

No new matter is added by any amendment, and all amendments are supported by the specification as filed.

35 U.S.C. 103(a) rejection

In the Office Action mailed June 19, 2006, claims 1-22 were rejected under 35 U.S.C. 103(a) over Dufor (US patent 4933541) in view of Iizuka (US patent 6469831). The argument in the Office Action is not repeated in its entirety here.

The current invention is a method to reduce noise from a multi-line laser system. One problem with multi-line laser systems is that several lines compete for the overall gain of the system, and the relative circulating intensity of the lines fluctuates. The overall power of the system can remain constant while the relative line strength changes (specification, page 2, lines 3-5). The solution shown in the current application is to match the spectral dependence of light at a monitor (output monitor detector) to the

spectral dependence of a desired signal (scattered light, for example) and then subtract the signals.

Dufor (US patent 4933541) is a method to inspect a surface using a diode laser in the presence of high intensity external light (background noise). The signal is divided into two channels. In one channel, the light is passed through a narrow bandwidth filter which passes the wavelength of the laser, so the signal is projected light (laser light having no noise) and external light (having background noise). The light in the second channel is passed through a narrow bandwidth filter which filters the laser light, so the signal is only the external light (background noise). The channels are then subtracted, so the output is only the projected laser light. (Dufor, abstract). Figure 3 of Dufor shows the spectrum of the light emitted by a welding arc and a molten metal particle. Reference number 66 shows the output of the diode laser (note the lack of a spectral response) and reference number 64 shows the spectral response of the interference filter centered on the spectral line of the laser diode.

The invention is not obvious over the combination of Dufor and Iizuka. A prima facie case of obviousness has not been made in this case. There is no suggestion or motivation to modify the references or combine references. Iizuka is cited for the teaching of a multi-line laser (claim 5). However, there is no suggestion for using such a system in Dufor, and no motivation for using such a system, as discussed more fully below. There is no reasonable expectation of success since there are no teachings of modifying Dufor to use a multi-line laser source. The laser source of Dufor is a monochromatic light source such as a laser diode (Dufor, column 4, lines 53-55). This is critical for the functioning of the Dufor system. As discussed above, the wavelength of the laser light source is (1) passed through a narrow bandwidth filter which passes the wavelength of the laser and the background noise; and (2) filtered using a narrow bandwidth filter, so that the signal passing is only the background noise.
Finally, the references do not teach or suggest all claim limitations. Dufor does not use a compensating optic, which is a required element of all claims of the current invention.

The Office Action stated element 34 was a compensating optic and stated: "Note that the compensating optic is also a focus optic and a Rayleigh optic as described in the instant application on page 5, line 19 and hence a Rayleigh correction can be applied by using a Rayleigh optic)." Element 34 of Dufor is a focusing lens. This is not the same as "compensating optic" as defined in the specification on page 8, lines 26-28 as follows: "The output from the standard optic is then passed into another optic (compensating optic 200) which flattens the spectral output." No element of Dufor includes any spectral flattening.

In addition, Dufor does not monitor or match the spectral dependence of a multi-line laser source—another required element of all claims of the current invention. Dufor's signals are: (1) a signal having the wavelength of the laser + background noise; and (2) a background noise signal having a different wavelength than the wavelength of the laser. These signals do not have the same spectral dependence.

In addition, the current invention claims a system and method for reducing noise from laser amplitude fluctuations. The system described in Dufor does not reduce the noise from the laser, rather, Dufor reduces background noise. This is a fundamental difference between Dufor and the current claims.

In the telephone interview with the Examiner on September 12, 2006, the Examiner indicated that the idea of spectral matching was inherent in a photodiode as used in Dufor (Figure 2, for example). This is incorrect. All photodiodes made of silicon have the same basic responsivity v. wavelength curve. If two photodiodes are detecting two different sources, each source has light copropagating at several wavelengths, but each source has a different amount of light at each wavelength. Each photodiode will respond to the wavelengths according to the intensity of light at that wavelength. In the current invention, both photodiodes respond in the same way since the intensity of the signals at the desired signal and monitor signal are constrained to be the same by the

use of a compensating optic. None of the elements of Dufor function as a spectral matching optic.

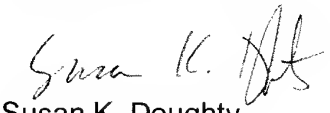
Dufor does use an amplifier for each signal and a subtractor of the signals, however, the basic feature of the current invention, spectral matching of the output of the desired and monitor signal is not present. The signals from each detector in Dufor have a different spectral contribution of noise.

In view of the above arguments and amendments, the claims are not believed obvious over the cited references. Reconsideration and withdrawal of the rejection is respectfully requested. If there are any issues remaining to passage of the case to issuance, the Examiner is respectfully requested to telephone the undersigned.

CONCLUSION

This response is accompanied by a Petition for Extension of Time (one month). Please deduct the amount due, believed to be $60, for the extension of time for a small entity from Deposit Account 07-1969. If this amount is incorrect, please credit any overpayment or deduct the appropriate fee from Deposit Account 07-1969.

Respectfully submitted,



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